

## Unit 1 Week 1 Practice Exam Questions

**Disclaimer:** This is a practice questions test that covers the material from the first week of Cell & Molecular Biology Lecture of 2012 that I could think of. This set of questions may not cover all the material needed for the actual exam. Please use this as a study tool, to test your knowledge over the given material.

1. With damage to this membrane bound organelle, the interior of the cell becomes toxic with built up of  $H_2O_2$  ?
  - a. Lysosomes
  - b. Peroxisomes
  - c. Mitochondria
  - d. Nucleus
  - e. Golgi
2. The following characteristics describe cells in light microscopy except...
  - a. Kinetic
  - b. Dynamic
  - c. Staining
  - d. Live
  - e. A & C
3. Which of the following statements regarding necrosis is false?
  - a. pyknosis
  - b. Uncontrollable release of cellular contents
  - c. Elicits inflammatory response
  - d. Cell rounding and shrinkage
  - e. A & D
4. Which of the following explains hydrophobic effect?
  - a. Polar molecules dissociate leading to release of free energy
  - b. Greater disorder in nonpolar molecules leads to release of free energy
  - c. High dielectric constant of water diminishes strength of electrostatic attractions between other nonpolar molecules
  - d. Nonpolar molecules aggregate together leads to higher entropy
  - e. Nonpolar molecules aggregate together leads to lower enthalpy
5. Shane is playing golf with his college buddies and gets hit on the head with a golf club, which causes to his breathing to slow and shallow breaths (hypoventilating) what physiological response will occur to return to homeostasis?
  - a. Build up of  $CO_2$  shifting the equilibrium to the left
  - b. Build up of  $CO_2$  shifting the equilibrium to the right
  - c. Build up of  $H^+$  due hypoventilation
  - d. Loss of  $H^+$  due to hypoventilation
  - e. A & C
6. Which of the following amino acids have polar uncharged R groups
  - a. Glutamate & Serine

- b. Alanine & Tyrosine
  - c. Cystine & Asparagine
  - d. Threonine & Asparagine
  - e. Lysine & Proline
7. Which of the following secondary structures is most likely to be found in a membrane embedded portions of a protein?
- a. An alpha-helix composed of hydrophobic residues
  - b. A beta-pleated sheet composed of hydrophilic residues
  - c. An alpha-helix composed of hydrophilic residues
  - d. A beta-pleated sheet composed of hydrophobic residues
  - e. An alpha-pleated sheet composed of hydrophobic residues
8. Given that the molecular mass of a protein is 9.9 kD, how many amino acids are approximately in the protein?
- a. 900
  - b. 90
  - c. 9
  - d. 1089
  - e. 0.09
9. Which of the following types of CJD is the most common found in humans?
- a. Variant
  - b. Inherited
  - c. Sporadic
  - d. Genetic Mutation
  - e. Iatrogenic
10. Which of the following are required for actin assembly and disassembly
- a. Mg
  - b. ATP
  - c. F-actin
  - d. A & B
  - e. A, B, & C
11. Which of following drugs should be administrated to inhibit polymerization of tubulin?
- a. Vincristine
  - b. Phalloidin
  - c. Taxol
  - d. Vinblastine
  - e. Colchicine
12. Centriole duplication begins at what stage in the cell cycle?
- a. Prophase I
  - b. Mitosis

- c. S-phase
  - d. G-2 phase
  - e. G-1 phase
13. Women have a higher average concentration of hemoglobin.
- a. True
  - b. False
14. Which type of granulocytes have a bi-lobed nucleus and are seen in allergic reactions
- a. Basophils
  - b. Neutrophils
  - c. Eosinophils
  - d. Monocytes
  - e. Megakaryocytes
15. Which protein is mutated in Hereditary Spherocytosis?
- a. Spectrin
  - b. Actin
  - c. Band 4.9
  - d. A & B
  - e. A, B, & C
16. Why is bilayer sheet energetically favored and stable?
- a. Hydrophilic interactions drives formation of stable structures
  - b. Close packing of hydrocarbon tails due to Van der Waals attractive forces
  - c. Amphipathic nature of membrane lipids
  - d. A & C
  - e. B & C
17. To increase the fluidity of the membrane one could...
- a. Introduce longer acyl chains
  - b. Introduce cholesterol
  - c. Add shorter acyl chains
  - d. A & B
  - e. B & C
18. The following lipids have a greater percentage on the exoplasmic leaflet side
- a. Choline
  - b. Sphingomyelin
  - c. Amino-phospholipids
  - d. A & B
  - e. A & C
19. Choose the false statement about the function of epithelia
- a. Selectively permeable barrier

- b. Can regenerate and repair itself
  - c. Function as a sensory surface
  - d. Modification of cellular contents
  - e. Protection against chemicals, toxins, harsh environment
20. Kartagener's Syndrome results in the loss of...
- a. kinesin arms or radial spokes
  - b. Overactive flagella causing lung infections
  - c. Mutations in the respiratory epithelial lining
  - d. Structural dynein cross arms resulting in immotile cilia
  - e. B & D
21. Which of the following correctly describes the characteristics of Serous Secretions
- a. Thick viscous secretion, slippery, rich in mucinogens, found in goblet cells
  - b. Oily secretion, slippery, rich in lubricants, found in sebaceous gland of skin
  - c. Watery secretion, rich in enzymes and ions, found in parotid glands
  - d. Waxy secretion, rich in lipids, found in external auditory gland
  - e. B & C
22. What is the concept of cooperative transition in protein folding?
- a.  $\frac{1}{2}$  molecules are fully unfolded and  $\frac{1}{2}$  molecules are fully folded
  - b. All of the molecules are completely folded
  - c. Primary sequences cooperate with the secondary structure
  - d.  $\frac{1}{3}$  of primary sequence results in the unfolding the tertiary sequence
  - e. A & D
23. What type of technique is used to separate proteins based on the protein's specific binding affinity
- a. Isoelectric focusing gel
  - b. SDS-PAGE
  - c. Distillation
  - d. Affinity Chromatography
  - e. Dialysis
24. Why is amino acid sequencing important?
- a. Comparisons between species yields information about evolutionary pathways
  - b. Used to generate specific antibodies against the protein for further affinity purification
  - c. Used to make DNA probes specific for the genetic sequence
  - d. Protein function can be inferred from sequencing
  - e. All of the Above

25. Which GLUT transporter is insulin responsive
- GLUT 2
  - GLUT 6
  - GLUT 5
  - GLUT 4
  - GLUT 3
26. All of the following are characteristics of Nicotinic Acetylcholine Receptor except?
- Dissociation of Acetylcholine opens the channel
  - Acetylcholine receptors are located at the NMJ
  - Large influx of  $\text{Na}^+$  into the cell
  - Action potential leads to muscle contraction
  - A & C
27. How do cardiotonic steroid drugs function?
- Inhibits the efflux of  $\text{Na}^+$
  - Inhibits the function of Na/K ATPase
  - Promotes the function of  $\text{Na}^+$
  - Promotes the function of Na/K ATPase
  - A & B
28. Cyclins bind to Cdks to regulate their activity. Pick the appropriate cyclins used during the G-1 Phase.
- Cyclin A
  - Cyclin B
  - Cyclin C
  - Cyclin D
  - Cyclin E
  - A & D
  - A & E
  - D & E
  - C & B
  - C & D
29. During the cell cycle there are numerous checkpoints to ensure cell division creates functional cells and machinery. Which of the following proteins arrests damaged cells during the G-1/ S Phase?
- E2F
  - p53
  - Cyclin A
  - Rb
  - B & D
  - A & B
  - A & C
  - C & D

- i. All of the Above
- j. None of the Above

30. Which of following statements regarding pro-metaphase is false?
- a. Nuclear envelope breaks down and disappears
  - b. Chromosomes are aligned at the equator
  - c. Chromosomes are arranged randomly
  - d. Chromosomes attach to spindle microtubules via kinetochores
  - e. None of the Above

**ANSWERS**

1. B	6. D	11. E	16. E	21. C	26. A
2. C	7. A	12. C	17. E	22. A	27. B
3. E	8. B	13. B	18. D	23. D	28. H
4. D	9. C	14. C	19. D	24. E	29. E
5. E	10. D	15. A	20. D	25. D	30. B